

OSTEOSARCOMA OF THE MANDIBLE.*

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IN reporting a case of osteosarcoma of the mandible, my object is to point out how it may be possible to remove half of the mandible with the least possible deformity resulting.

As pointed out in many of the text-books, the performance of this operation without ligation of the external carotid is still in practice; but as the patients are usually aged, and since loss of blood without ligation cannot be avoided, it seems best to me to discard the old operation and insist upon the necessity of primary ligation of the external carotid artery.

In doing the operation without ligation, the surgeon must count upon the rapidity of his work and the dexterity of his action and that of his assistants to control the loss of blood. This very often miscarries, and the patient loses a terrific amount of blood. The operation by ligation of the external carotid as a primary procedure and the closure of this wound may be performed without entering into the field of removal of the mandible, even though the bifurcation of the carotid may be as high as the greater cornua of the hyoid bone, provided there is no glandular involvement, as is possible and probable in carcinoma.

This primary ligation, while it prolongs the operation slightly, renders the removal of the mandible much more efficient; and the operator is not impeded by the loss of blood or the possibility of septic pneumonia dependent thereon.

It is argued by some that the artery forceps will control the hemorrhage and save the time of the operator and necessarily the length of the anæsthesia; this some are willing to assign as the cause of the pneumonia rather than the septic material, plus the loss of blood, injury to the part in manipulation, and

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the non-warming of the inspired air before it enters the lungs. It is known that in the removal of so vital a part as half of the mandible, as in all major operations, the minimum loss of blood, the minimum interference with the temperature of the inspired air, the minimum incision in the removal of any part, and the minimum of time in its performance are all factors tending toward favorable termination.

Having followed the usual course as given in the text-books in former procedures and in the bloody clinical services in which I have been a participant, it seemed possible that the desired end could be reached in carrying out the principles above stated. A suitable case presenting itself at the American Oncologic Hospital, I applied the principles as above outlined.

The patient, C. S., colored, aged 36, married, a domestic, was admitted on February 10, 1908.

About ten years ago noticed vague pains in the right side of the mandible. There was no history of any injury from outside sources. The first thing she noticed was a small hard lump in the navel of the sixth-year molar, ten years ago. Eleven months ago, following a bad toothache, she had the lower second bicuspid and sixth-year molar extracted on account of pain. Since the extraction of the teeth the tumor has grown rapidly and was at the time of her admission about the size of an English walnut. In Sept. 1907, ulceration took place on the face; she has had the projection into her mouth removed two or three times since teeth were extracted. The growth on the right side of the body of the mandible occupied the site of the second bicuspid and of the sixth- and twelfth-year molar teeth. This was very dense and occupied the alveolar process and extended caudad into the body of the mandible, and was connected with the outside of the face by a sinus which discharged blood and pus. The growth was seen to occupy the vestibular and buccal surfaces of the alveolar process, and surrounded the first bicuspid and extended to the middle and partly surrounded the twelfth-year molar. Apparently the wisdom tooth had not been erupted. There were no glands anywhere in the submandibular triangle. The thoracic and abdominal organs were all normal. Blood and urinary examinations were made.

Patient was in the house sixteen days under observation before operative interference was considered, and during this time all preparations and examinations possible were made.

On March 19, 1908, the patient was placed under chloroform anesthesia and the external carotid artery of the right side ligated. The performance of this operation was rather difficult because of the unusual position of the artery. Bifurcation did not take place until the great cornu of the hyoid bone was reached. This of course increased the length of time of the performance of this operation, first because of its unusual position, and second because it was necessary to avoid entering the buccal cavity. The vertical incision was made in the middle line through the lip to the caudal margin of the mandible, dividing all the muscles to the bone. The left inferior coronary artery was ligated; the skin incision followed the caudal margin of the mandible as far dorsal as the position of the facial artery. The levator menti, depressor labii inferioris, depressor anguli oris, platysma myoides, and buccinator muscles were divided by the scalpel, care being taken to leave muscular attachments and not tear away the periosteum. These manipulations extended up to but not through the vestibular fornix of the mucous membrane. The scissors were now substituted for the scalpel and divided the masseter muscle, the stylomandibular ligament, and part of the capsular ligament on the ventral and lateral parts of the condyle. The mandible was divided by a chain-saw, after pulling the right central incisor. The bone was violently depressed and the temporal muscle, severed from the mesial surface and apex of the coronoid process and caudal fornix of the mucous membrane, was now divided, taking pains to adhere as closely as possible to the ventral margin of the ramus and to pass as far cephalad on this margin, thus avoiding all interference with Stenson's duct. The buccal mucous membrane, together with one geniohyoid muscle and the mylohyoid, the internal and external pterygoid muscles, and the sphenomandibular, internal lateral, and the remaining part of the capsular ligaments were divided, severing also in this procedure the inferior dental artery and nerve, the myoid artery and nerve, and their accompanying veins. The half of the mandible was now easily removed by a twisting movement and the free use of scissors close to the bone, the condyle being practically twisted out of its capsule and the socket in the temporal bone. There was decided venous ooze from the pterygoid region, but this was easily controlled by

FIG. 1.



Osteosarcoma of mandible. Appearance of patient before and after removal of the affected half of the mandible.

Fig. 2.



Osteosarcoma of mandible. Portion of mandible removed, and microscopic section from growth.

iodoform gauze packing; all apparent glands were removed. Buccal and vestibular fornices of mucous membrane were united by interrupted silkworm-gut sutures. The drainage for forty-eight hours was through the most dependent portion of the facial wound. One and a half metres of iodoform gauze were packed into the interval between the masseter and pterygoid. The sinus in the skin of the face, of course, was cut out and independently sutured. There was slight oozing for forty-eight hours after the operation, but after the removal of the packing and irrigation of the cavity there was no further trouble.

Present Condition.—The patient is not able to adjust the mandibular with the maxillary incisors owing to the contraction of a fibrous band in the position formerly occupied by the removed portion of the mandible.

The patient has no difficulty in masticating soft food; and I have to report at this time that she is in perfect health without any recurrence anywhere, and is under weekly observation, as she is employed about the institution.

I have to submit photographs taken before and after the operation; one of the part removed, an autochrom, microscopic slides of the growth, together with microphotographs (Figs. 1 and 2).

The patient at no time during her entire stay in the institution, before, during or after the operation, except as the reaction after her operation, had a temperature above $99\frac{2}{3}^{\circ}$.

The pathological investigation was made by Dr. John M. Swan, who pronounced the growth a round- and spindle-celled sarcoma of the body of the mandible. The section is composed of irregular trabeculæ tissues which correspond to the trabeculæ of the bone, between which are spaces occupied by altered marrow tissues. In the tissues corresponding to bone trabeculæ there is no evidence of normal bone tissue except out in the periphery of the section. The tissue is composed of numerous large round cells with occasional spindle cells separated by a distinctly fibrillar connection of tissue. The marrow tissue occupying the space is poor in cells and has undergone myxomatous degeneration. There are giant cells in places, in the altered marrow tissues. The bone trabeculæ which have not been invaded by the new growth is poor in cells. No canaliculæ are visible, and the matrix looks as though it had undergone myxomatous change.